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**EUROPEAN PATENT APPLICATION**

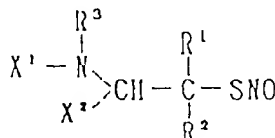
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**AT BE CH DE DK ES FR GB GR IT LI LU NL SE**(66) Date of deferred publication of the search report:  
04.09.91 Bulletin 91/36(71) Applicant: **TAKEDA CHEMICAL INDUSTRIES,  
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Elkington and Fife Beacon House 113  
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London, WC2B 6PP(GB)(54) **Nitrosothiol derivatives, their production and use.**

(57) Novel nitrosothiol derivatives of the formula:



not an acetyl group or  $\gamma$ -glutamyl group, and salts thereof, show excellent hypotensive action, anti-arrhythmic action, anti-anginal action, cardiotonic action or coronary vasodilation, thus being useful as therapeutic or prophylactic agents for the cardiovascular diseases such as hypertension and angina pectoris.

wherein R<sup>1</sup> and R<sup>2</sup> are independently a hydrogen atom or a hydrocarbon residue which may be substituted; R<sup>3</sup> is a hydrogen atom, an acyl group or a hydrocarbon residue which may be substituted; X<sup>1</sup> is a hydrogen atom, an acyl group, a lower alkoxy group or a hydrocarbon residue which may be substituted; X<sup>2</sup> is an acyl group or a carboxyl group which may be esterified or which may form an amide; with a proviso that when X<sup>2</sup> is a carboxyl group X<sup>1</sup> is not a hydrogen atom or acetyl group and that when both R<sup>1</sup> and R<sup>2</sup> are hydrogen atoms X<sup>1</sup> is

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## EUROPEAN SEARCH REPORT

Application Number

EP 90 30 8340

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	TETRAHEDRON LETTERS vol. 26, no. 16, 1985, pages 2013-2016, GB; T.W. HART: "Some observations concerning the S-Nitroso and S-Phenylsulphonyl derivatives of L-Cysteine and glutathione" * the whole document *	1-4, 13-25,35	C 07 C 381/00 C 07 K 5/00 A 61 K 31/655
A	JOURNAL OF THE CHEMICAL SOCIETY - PERKIN TRANSACTIONS I 1979, pages 1969-1974; R. BONNETT et al.: "Nitrosation and Nitrosylation of Haemoproteins and Related Compounds. Part 2. The Reaction of Nitrous Acid with the Side Chains of alpha-Acyl-amino-acid Esters" * the whole document *	1-4, 13-17,35	
A	TETRAHEDRON LETTERS vol. 26, no. 32, 1985, pages 3879-3882, GB; T.W. HART et al.: "Thiolsulphonate derivatives of amino acids" * the whole document *	1-4, 13-25,35	
A,P	US-A-4 900 719 (G.E. MEANS et al.) * the whole document *	1,33,34	
A,D	ANGEWANDTE CHEMIE vol. 87, no. 10, 1975, pages 372-378, Weinheim, DE; W.M. WEIGERT et al.: "D-Penicillamin - Herstellung und Eigenschaften" * the whole document *	35	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	CHEMICAL ABSTRACTS vol. 95, no. 15, 12 October 1981, page 62, abstract no. 126235k, Columbus, Ohio, US; D. ZIEBARTH et al.: "Nitrosation of orally administered drugs under simulated stomach conditions" & IARC Sci. Publ. 1980, vol. 31 (N-Nitroso Compd.: Anal., Form. Occurrence), pages 231-244	1,33	C 07 C 381/00 C 07 K 5/00 A 61 K 31/00
The present search report has been drawn up for all claims			
Place of search Berlin		Date of completion of search 21 June 91	Examiner RUFET J.M.A.
<div>CATEGORY OF CITED DOCUMENTS</div> <div>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention</div> <div>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &amp;: member of the same patent family, corresponding document</div>			